

BULLETIN OF MISCELLANEOUS INFORMATION Appendix I. 1926. ROYAL BOTANIC GARDENS, KEW.

REVIEW OF THE WORK OF THE ROYAL BOTANIC GARDENS, KEW, DURING 1925.

The Gardens.

The number of visitors to the Gardens in 1925 was 1,671,840. This was an increase of 135,985 over those recorded for the previous year.*

His Majesty King Feisul paid an official visit to the Gardens in the early summer.

Among other distinguished visitors may be mentioned H.R.H. Prince Chandhaburi and His Excellency The Siamese Minister ; the Lord Chamberlain, in connection with the proposal to display the collection of old prints and engravings relating to the history of the Royal Botanic Gardens and the Village of Kew, now in Museum No. III, in two of the rooms in Kew Palace.

NEW PLANT HOUSES.—The most important structure erected in 1925 is a house for rhododendrons. This has been built on the western side of the Temperate House terrace in the recess between the large middle section and the Himalayan House. It backs on to the North Octagon, to the outside wall of which it has been ingeniously adapted by H.M. Office of Works. The wood-work is of teak and the roof, which consists of three ridges, is constructed to provide ample ventilation, the absence of which is a defect in the adjoining Himalayan House. Its dimensions are approximately as follows :—Length 60 ft. ; average width 40 ft. ; greatest height 25 ft. Sufficient hot-water piping has been provided to keep out frost in all but the very severest weather. It will be entered from two doors abutting on the long central walk which traverses the whole length of the various sections of the main building, also by one opening on the terrace. The central area is occupied by a rectangular bed 42 ft. by 21 ft., surrounding which is a path 4 ft. wide. A border $5\frac{1}{2}$ ft. in width comes between the path and the walls. The purpose of this house is to provide accommodation for Chinese rhododendrons. The introduction of these shrubs, many of which are extremely beautiful and distinct, from the mountainous regions of the south-western provinces of China, has constituted perhaps the most important event in horticulture during the last decade. The name of Mr. J. C. Williams, of Caerhays, will always be remembered as the prime mover and main

* The charge of one penny for admission, which was removed in 1924, was reimposed as from 1st January, 1926.

supporter of this enterprise, as will that of Mr. George Forrest as chief collector. But mention of the admirable work done by Capt. Kingdon Ward during recent years in the same connection must not be omitted, nor that of Mr. Reginald Farrer—although so unhappily cut short by his death in 1920.

Whilst these rhododendrons are proving themselves to be splendidly adapted to the gardens of Cornwall and places with a similar climate, it has become evident that many of the best of them, especially those with large leaves, are ill suited to the outdoor conditions at Kew, and that if they are to be represented at all satisfactorily here, protection will have to be afforded them. On the whole they are not so hardy as the species introduced by Mr. E. H. Wilson in the early years of this century from regions farther to the north, almost all of which bear the winter cold at Kew with impunity. Still the chief drawback in their cultivation is due to the late spring frosts so frequent at Kew, which not only cut back the young growths but destroy the flowers also.

A heated span-roof house, 50 ft. long, 9 ft. high, 18 ft. wide, has been erected in the Arboretum Nursery in place of an unheated "skeleton" structure there which could only be protected by a covering of canvas. This will be attached to the Temperate House department and used for growing on plants for the various sections of that House.

A "pit" 60 ft. long, 10 ft. wide, with a sunken central path has been built in the private frame yard of the Herbaceous Department to provide further accommodation for delicate and rare Alpine plants.

The collection of succulent plants has increased very considerably in recent years, and a frame 45 ft. long in the "Melon Yard," near the Curator's Office, has been built between houses No. 19 and No. 20 to give the additional space needed.

Owing to the injurious effects on the plants in the Orchid Houses occasioned by the continual opening of the doors by visitors, especially in cold windy weather, a wooden porch has been erected outside the sections 14 and 14A. This encloses the two entrance doors and thus mitigates very largely the effects of draughts from the outside air.

The following plant houses have been painted during the summer:—Cactus House, Stove, Begonia and Cape Houses, Orchid Houses, North end of the Palm House, and the two tropical Propagating Pits.

OBJECTS OF SPECIAL INTEREST.—During the year a part of the Cattleya House (No. 14C) adjoining the Orchid Houses, has been adapted and opened to the public for the exhibition of special displays and plants of particular interest. These exhibitions have been creating much popular interest during the last few years, and the houses in which they were accommodated had not sufficient passage way to permit visitors to linger over these exhibits without blocking the way to other parts of the houses. Considerable

disturbance of the collections also resulted when staging space had to be cleared for a special exhibit. Several exhibitions have been specially staged during the year, their meaning being explained by descriptive notices and labels accompanying the plants. The following subjects have been shown :—Phyllodes and phylloclades; examples of parallel development in plants belonging to unrelated Natural Families; the development of Winter Flowering Begonias, illustrated by examples of the wild species from which they originated, first hybrids and present-day varieties; the development of the Petunia was shown on similar lines; and plants of economic value have also been exhibited.

GREENHOUSE FERNS (No. 3 House).—In order that visitors may more conveniently inspect the ferns in this house and gain a better idea of their beauty and structure, the central stage, on which they were grown in pots, has been removed and the space it occupied has been enclosed by an informal arrangement of stones and the ferns planted out in prepared soil a little above ground level. Here they are thriving extremely well and afford one more example of how most plants prefer such treatment to having their roots confined in pots. The side stages, which were too high for all but tall people to see the plants properly, have been divided longitudinally into two sections, the front one of which has been lowered about nine inches. The whole aspect of the house has been much improved thereby.

ROSE GARDEN.—The new arrangement of garden varieties of roses in the sunken area west of the Palm House which replaced the old beds of miscellaneous shrubs (see *K.B.* 1924, p. 29), has proved very popular with visitors. Although it is somewhat outside the main purposes of the establishment, there is probably no public garden in this country where garden lovers are able to inspect and enjoy so extensive a display of roses. The numerous enquiries received as to where the varieties can be obtained show that it is appreciated.

ROCK GARDEN.—The gradual substitution of the various kinds of stone of which the Rock Garden was originally constructed in 1882 by one of a uniform type was interrupted on account of the war. During the past autumn the work has been resumed and a section at one side of the north end has been rebuilt, a mixed lot of stones having been replaced by weathered boulders from the Craven moors in Yorkshire. This stone is now very popular in rock gardening and in general appearance scarcely differs from material obtained from the Mendips—such as has been used in previous sectional renovations of the Rock Garden. One side of the Rock Garden is now finished and there only remains to be done a section built up of huge boulders of oolite from Gloucestershire, which has now a somewhat incongruous appearance.

IRIS GARDEN.—It is now over thirty years since the collection of irises was planted on its present site (D.10). As is generally known, the popular sections of this genus need a change of soil at

pretty frequent intervals to obtain the best results. The convenience of the present site, and its nearness to the rest of the herbaceous collections, made it undesirable to transfer the irises to an entirely new area, so the alternative of providing new soil on the existing one was adopted. This has occupied two seasons but is now completed. The leading authority on the genus, the late Mr. W. R. Dykes, whose tragic death has occasioned so great a loss to horticulture and botany, kindly helped with his advice in apportioning space for the various sections and in giving hints about their cultivation. We have also to thank Messrs. Wallace and Co., of Tunbridge Wells, and The Orpington Nurseries Co., for their kindness in presenting numerous plants of the best garden varieties, thereby bringing the collection to a more up-to-date condition.

HARDY FERNS.—About forty years ago Mr. Carbonell bequeathed his collection of British ferns to Kew but since then no considerable additions have been made to the collection. There is, however, a small but enthusiastic band of cultivators, united in the Pteridological Society, who have in the meantime been industriously raising and discovering new forms, most of which are lacking at Kew. Last autumn, three leading members of the Society, namely, Mr. Cranfield, Mr. Henwood and Dr. Stansfield, kindly offered to overhaul the collection, naming varieties whose identity has been lost, selecting plants which should be retained, and indicating those that might be rejected from the collection. A thorough knowledge of the numerous forms of these hardy ferns can only be acquired by those who are able to devote considerable time to their study, so Kew was glad to take advantage of the expert knowledge these gentlemen possess, especially as they made a generous offer also to contribute from their own collections such varieties as they could spare which were not represented here. They spent a considerable part of two November days at the work.

By removing a few large trees and some clumps of shrubs from the North Western portion of the Wild Garden surrounding the Temple of Æolus, sufficient space has been obtained to accommodate the greater part of the revised collection, a border ranging from 6 ft. to 20 ft. in width having been thoroughly trenched and the soil improved by the addition of peat moss and leaf soil. In order that fern-lovers may be able more closely to inspect the plants, the area is traversed by a winding path about 112 yards in length irregularly paved with York Stone.

IVY COLLECTION.—A collection of ivies is a difficult one to accommodate owing to the climbing space they need. When Mr. Shirley Hibberd's collection was acquired for Kew thirty to forty years ago, many of them were planted to grow over inverted tree stumps on the western side of the Sion Vista. For a good number of years they succeeded very well and many of them still exist there, but ultimately, owing to lack of opportunity to climb they assumed the flowering or "tree" form and thus lost their

chief attraction and much of their individuality. It is now proposed to devote the long east wall of the Herbaceous Ground, abutting on Kew Road, to ivies, replacing the common ivy with which it is at present clothed by the named collection. A beginning was made last spring.

ARBORETUM.—The provision of space for the growing collections of hardy trees and shrubs is a problem that intensifies year by year. The main lines of the present arrangement of Natural Families and Genera were schemed by Sir Joseph Hooker about 1870 when the developments of the XXth century, especially as regards Chinese introductions, could not have been foreseen. Since then the number of species and varieties in cultivation has more than doubled, and some sections are much too overcrowded. The maple collection for instance is one for which no further space in its present location is available. The collection of *Rosaceae* is another for which the need of additional room is imperative. In order to keep the members of this important Natural Family on one area, a piece of ground between the Holly Walk and the Service Road (L 6) has been cleared of a mixed lot of small trees. This will be occupied by the *Saxifragaceae*, the whole of which it is intended to plant west of the Holly Walk, where part of the Family is already established. This will enable us to allot the whole of the area south of the Temperate House that lies between the Holly Walk and the Pagoda Vista to the *Rosaceae*. Except for a few trees of *Prunus* too large to move, now growing in and near the "Canal" beds, the collection will be in a compact, well-defined space.

CEDAR VISTA.—The widening and re-turfing of this popular promenade, referred to in the *Review of Work during 1924* (K.B. Appendix II, 1925, p. 38) has proved a great success. The Vista was kept closed during the early summer and this enabled the newly-laid turf to get thoroughly established. A sweep of closely mown turf now extends from the Lake to the Pagoda broad enough, it is hoped, to stand the increasing foot traffic in this part of the Gardens. We are not able, however, to feed our lawns now in the way that was possible before the advent of the motor omnibus. Twenty to thirty years ago the proprietors of the old horse-drawn vehicles were glad to deliver annually, at an almost nominal price, hundreds of loads of manure into the depôts. This, of course, came to an end long ago, and it is now difficult to get sufficient good manure for our ordinary cultures.

DECAYED TREES.—A considerable amount of labour has been employed during the autumn in felling trees. Most of these were beeches which (as was feared at the time) never recovered from the effects of the drought of 1921. Several old elms also have had to be taken down, notably two very large trees near the Main Entrance, which had begun to drop limbs and consequently became dangerous owing to visitors taking shelter beneath them on showery summer evenings.

TARRING PATHS.—The treatment of the walks with hot tar and pea gravel, commenced in 1923, was continued during the summer of 1925. Amongst others the long Broad Walk was done. Although all the more frequented walks have now been treated, it is intended to continue the work during the coming season. We find also that to get a really satisfactory result a walk has to be done twice, the second time, however, requiring much less material than the first. One result of this treatment of the paths we find to be that visitors do not walk on the grass verges so much. Consequently less repairing of these verges and less re-turfing generally was necessary last autumn.

THE FLAGSTAFF.—It becomes periodically necessary to treat the Douglas Spar with preservative and the work has been undertaken this year.

Old and defective preservative was carefully removed to the bare wood. Shakes in the timber were then faced with a plastex material, the tops of shakes being left open, in which hot solignum was poured. When saturation was completed the whole of the shakes were completely filled with the plastex material, and the Spar was twice coated with hot solignum, the work being commenced at the top.

The wire rope stays and all metal fittings were cleaned and treated with two coats of bitumastic paint, and all defective bindings of canvas, etc., were removed from shackles; the shackles were then well coated with grease, and rebound with new canvas.

PUBLICATIONS.—Eight sets of picture postcards of plants in natural colours have been placed on sale during the year, at the Publications Kiosk in the Gardens. Each set contains six cards with a descriptive folder of the subjects, and is priced at one shilling. Individual cards can be purchased at twopence each. The sets are devoted to Insectivorous and Stove Plants, Decorative Plants, Orchids, Stove and Greenhouse Plants, Rock Garden and Herbaceous Plants and Rhododendrons. The most popular card has proved to be a picture of the Bluebells in Queen's Cottage Grounds.

Three new sets, comprising twenty-one black-and-white cards, have also been placed on sale. This increases the total of subjects represented by plain photographs to eighty-four.

Five revised Hand-Lists have been published. They are Trees and Shrubs, Herbaceous Plants, Rock Garden Plants, Hardy Monocotyledons and Coniferae.

ADDITIONS TO GARDENS, 1925.—The number of separate consignments of living plants and seeds presented to the Gardens was 820. This represents an increase of 71 on that of 1924 and constitutes a further record in the history of the Establishment. A striking increase in the number of private donors is worthy of note. The most important donations were the following :—

Public Institutions :—

Aberdeen, Cruickshank Botanic Garden.—Plants of new Siamese introductions, including *Primula siamensis*, *Didymocarpus Wattiana* and *Chirita Marcanii*.

Amani Institute, Tanganyika Territory.—69 packets of seeds.
 Arnold Arboretum.—Seeds, grafts and plants of hardy trees and shrubs.
 Arboretum Vilmorinianum, Les Barres, France.—68 packets of seeds and hardy trees and shrubs.
 Brno Botanic Garden, Czecho-Slovakia.—58 packets of seeds.
 Buitenzorg, Botanic Garden.—Seeds of palms and economic plants.
 Cambridge, Botanic Garden.—Seeds, plants and cuttings.
 Chelsea Physic Garden.—A Collection of Liverworts, seeds and plants, including *Encephalartos Hildebrandtii*.
 Darjeeling, Lloyd Botanic Garden.—235 packets of seeds.
 Dehra Dun, Forest Research Institute.—Collections of seeds of economic plants.
 Dunedin, Botanic Garden.—130 packets of seeds, including many varieties of *Phormium tenax*.
 Edinburgh, Royal Botanic Garden.—162 packets of seeds; plants of *Ibervillea Lindheimeri*, *Calceolaria spp.*, etc.
 Floriana Botanic Garden, Malta.—58 packets of seeds.
 Geneva, Botanic Garden.—82 packets of seeds.
 Glasgow, Botanic Garden.—Seeds and plants, including *Bomarea Carderi* and *Begonia Moorei*.
 Glasnevin, Botanic Garden.—52 packets of seeds; plants of *Drosera pygmaea*, *Schomburgkia Wallisii* and *Calceolaria spp.*
 Gothenburg, Botanic Garden.—Collection of *Sedum spp.*, including *S. Stribrnyi*.
 Grahamstown, Botanic Garden, S. Africa.—Seed of *Araucaria Bidwillii*.
 Hongkong, Botanic Garden.—Seeds, including *Tutcheria spectabilis*.
 Hyde Park.—Collections of bedding and decorative plants.
 Honolulu, Forestry Department.—Seed of *Argyroxiphium sandwicense* var. *macrocephalum*.
 John Innes Horticultural Institute, Merton.—Plants of *Calceolaria spp.*
 Kirstenbosch Botanic Garden, South Africa.—Seeds and plants of Cape *Pelargonium spp.*, and *Erica spp.*
 Leiden, Botanic Garden.—52 packets of seeds.
 Leningrad, Botanic Garden.—96 packets of seeds.
 Lisbon, Botanic Garden.—46 packets of seeds; plants of *Eichhornia crassipes*, and *Marsilea aegyptiaca* var. *lusitanica*.
 Melbourne, Botanic Garden.—30 packets of seeds and corms of hybrid *Watsonias*.
 Montevideo, Botanic Garden.—78 packets of seeds, including *Verbena bonariensis*.
 Montpellier, Botanic Garden.—57 packets of seeds.
 Orotava, Botanic Garden, Teneriffe.—A collection of 22 varieties and species of *Musa*.
 Ottawa, Central Experimental Farm.—64 packets of seeds.
 Penang, Botanic Gardens.—A collection of fern spores collected at Kedah Peak.

- Pruhonice, Prag, Dendrological Society.—Collection of hardy trees and shrubs.
- St. Louis, Botanic Garden, Missouri.—Collection of Panama Orchids, *Nymphaea spp.*, and plants of *Dionaea muscipula*.
- Sierra Leone, Dept. Lands and Forests.—Stem cuttings of Sugar-cane; corms of *Gladiolus spp.*, etc.
- Singapore, Botanic Garden.—Collection of ferns, orchids and stove plants.
- Tiflis, Botanic Garden.—60 packets of seeds.
- Tokyo, Botanic Garden.—Seeds of *Taiwania cryptomerioides*, etc.
- Trinidad, Dept. of Agriculture.—Plants of *Bougainvillea sp.* from Ecuador, seeds and fern spores.
- U.S. Dept. of Agriculture, Washington.—Economic plants including *Lecythis zabucajo*; plants of *Sarracenia spp.*, etc.
- Zurich, Botanic Garden.—Seeds and plants including *Semprevivum Mogridgei* and *Mesembryanthemum Püttkammerianum*.
- Private Donors:—*
- Mr. B. C. Aston, Wellington, New Zealand.—Seeds of New Zealand plants.
- Mr. S. C. Atchley, Athens, Greece.—Seeds, bulbs and corms collected in Greece and Crete.
- Messrs. Barr and Sons, Covent Garden.—Seeds of *Celmisia spp.*, *Primula Menziesiana*, etc.
- Messrs. Bees, Ltd., Liverpool.—Plants of *Primula chrysopa*.
- Rev. A. T. Boscawen, Cornwall.—Plants and seeds; also seeds of *Telopia speciosissima*, from plants grown at Ludgvan Rectory, Long Rock, R.S.O., Cornwall, 1925.
- Messrs. Bowell and Skarratt, Cheltenham.—Hardy Orchids, including *Orchis Brancifortii* and *Habenaria chlorantha*.
- Mr. N. E. Brown, Kew.—Plants of *Mesembryanthemum spp.*, and Cape succulents.
- Mr. A. K. Bulley, Ness, Neston.—Seeds and plants of Alpines.
- Mr. A. C. Burrage, President, Massachusetts Horticultural Society, U.S.A.—A large collection of hardy North American *Cypripedium spp.*, plants of *Osmunda regalis* and *O. cinnamomea*.
- Mr. G. R. Cameron, Punta Arenas, Chile.—Seed of *Lathyrus magellanicus*.
- Col. Stephenson Clarke, Borde Hill, Cuckfield.—A collection of dwarf conifers.
- Sir Jeremiah Colman, Gatton Park, Surrey.—Plants of *Dendrobium cariniferum* and *Coelogyne sp.*
- Mr. A. T. Cussons, Manchester.—Plants of *Cypripedium sublaeve* and *C. venustum*.
- Mr. L. A. Dode, Paris.—Cuttings of trees and shrubs including *Populus Hickeliana*.
- Major A. A. Dorrien Smith, Tresco Abbey.—Plants and seeds, including *Pittosporum obcordatum*.
- Mr. E. J. Dunn, Kew, Victoria, Australia.—Seed of *Pentzia sp.*, and *Acacia Dunnii*.

- Lt.-Col. F. R. Durham, Kew.—Seeds and plants collected in the Canary Islands and South-West Africa.
- The late Mr. W. R. Dykes, Guildford.—Plants of *Iris nepalensis*, and a collection of *Tulipa spp.*
- Mr. F. Frith, South African Railways Ltd. (Wembley Exhibition).—A large collection of Cape succulents, including *Euphorbia Dregei*, *Frithia pulchella*, *Mesembryanthemum Lesliei*, and *M. Bolusii*.
- Hon. Vicary Gibbs, Aldenham House, Elstree.—Trees and shrubs.
- Dr. Gravely, Egmore, Madras.—Collection of succulents, including *Caralluma spp.*
- Prof. H. G. Greenish, Pharmaceutical Society, London.—Bulbs of *Urginea indica*, etc.
- Commendatore C. Hanbury, La Mortola, Ventimiglia, Italy.—134 packets of seeds.
- Marquis of Headfort, Kells, Co. Meath.—Plants of Forrest's dwarf *Rhododendron spp.*
- Dr. A. Henry, College of Science, Dublin.—Seeds of trees and shrubs.
- Mr. T. E. Henwood, Reading.—Hardy ferns.
- Messrs. Hillier and Sons, Winchester.—Hardy trees and shrubs.
- Sir G. Holford, Westonbirt, Tetbury.—Orchids, including *Masdevallia Arminii*, *Epidendrum Burtonii*, etc.
- Mr. E. M. Holmes, Ruthven, Sevenoaks.—Plants and seeds, including " *Rose verte* " and *Mentha piperita*.
- Ven. Archdeacon A. Hombersley, Trinidad.—Seeds of *Hibiscus spp.* and fern spores.
- Capt. C. Ingram, Benenden, Kent.—Seeds, plants and grafts of *Prunus spp.*
- Mr. G. H. Johnston, Grampound Road, Cornwall.—Plants of *Ilex corallina* and *Rhododendron Albrechtii*.
- Mrs. J. C. Rooke Johnston, Bagamoyo, Tanganyika Territory.—Seeds of *Nymphaea spp.*
- Mrs. W. Jones, Aberuchill Castle, Comrie, Perth.—Plants of *Meconopsis grandis*, *M. paniculata*, *M. quintuplinervia* and other alpine.
- Dr. A. F. G. Kerr, Bangkok, Siam.—Tubers of *Amorphophallus spp.*
- Mr. C. C. Lacaita, Selham House, Petworth.—Seedlings of *Melitella pusilla* from Malta and Gozo.
- Mr. C. H. Lankester, Costa Rica.—Collection of orchids, fern spores, etc.
- Sir W. Lawrence, Dorking.—Collection of hardy and half-hardy bulbous plants.
- Mr. G. W. E. Loder, Ardingly.—Trees and shrubs.
- Mr. J. A. MacPherson, Granity, West Coast, N.Z.—95 packets of seeds.
- Messrs. Mauger and Sons, Guernsey.—*Lachenalia spp.*
- Dr. E. D. Merrill, California.—Plants of *Darlingtonia californica*.

- Mr. H. Musk, Wye, Kent.—Hardy British Orchids and *Daphne Laureola*.
- The Orpington Nurseries Ltd., Kent.—A large collection of garden varieties of *Iris*.
- Major A. Pam.—South American Orchids and bulbs.
- Mr. E. E. Pescott, Melbourne.—Australian seeds, including *Hardenbergia Comptoniana*.
- Mr. N. S. Pillans, Rosebank, C.P., South Africa.—Seeds and plants of *Erica spp.*, and succulents.
- Dr. R. L. Praeger, Dublin.—*Sempervivum spp.*
- Sir J. Ramsden, Gerrard's Cross.—Plants, bulbs and corms, including *Gladiolus Mackinderi* and *Plectranthus chiradzulensis*.
- Mr. H. N. Ridley, Kew.—Plants of *Orchis laxiflora*, collected in the Channel Islands.
- Dr. F. A. Rodway, Nowra, N.S. Wales.—Seeds of Australian native plants.
- Mr. Lionel de Rothschild, London.—391 packets of seeds collected by Capt. Kingdon Ward.
- The Hon. Mrs. Ryder, Brockenhurst.—*Watsonia* and *Nerine spp.*
- Messrs. Sanders, St. Albans.—Orchids including *Vanda pumila*.
- Mr. N. B. Sansom, Banff, Alberta, Canada.—Collection of Canadian native plants.
- Mr. H. C. Shekell, Jamaica.—Collection of Tree Ferns.
- Mr. F. L. Skinner, Dropmore, Manitoba, Canada.—Seeds and plants, including *Houstonia longifolia* and *Lithospermum canescens*.
- Mr. F. W. Smith, Cannes, France.—Collection of hardy orchids.
- Dr. W. H. Stansfield, Reading.—Hardy ferns and alpiners.
- Mr. E. Taylor, Southborough.—Seeds, plants and cuttings of *Mesembryanthemum spp.*, and other succulents.
- Dr. R. B. Thomson, Toronto University, Canada.—*Sarracenia spp.*, from the Holland River.
- Mr. G. C. Turner, Kingston.—Large plants of *Agave spp.*
- Mr. C. B. Ussher, Sierra Madre, California.—Seeds, plants and cuttings of Californian plants.
- Messrs. R. Veitch and Sons, Exeter.—Plants of *Calceolaria Veitchii*.
- Mr. A. B. Voules, London.—Collection of *Vanda spp.*, *Renanthera spp.*, and plants of *Trichoglottis fasciata*.
- Sir O. E. Warburg, Epsom.—Plants and seeds, including *Arbutus spp.*, and *Drosophyllum lusitanicum*.
- Mr. James C. Watt, Aberdeen.—Seeds of Rhododendrons, collected in Northern India.
- Dr. A. H. Williams, Horsham.—Seeds of New Zealand plants.
- Mr. A. M. Williams, M.P., Launceston, Cornwall.—Plants, including a fine plant of *Rhododendron lacteum*, *R. cyclium*, and *R. tephropeplum*.
- Mr. J. C. Williams, Caerhays Castle.—326 packets of seeds collected by Mr. G. Forrest.
- Mr. P. D. Williams, St. Keverne.—Trees and shrubs.

Miss M. Wilman, Kimberley.—Seeds and plants of Cape succulents.

Miss E. Wilmott, Warley, Essex.—Collection of seedling *Pelargonium* spp.

Mr. A. Worsley, Isleworth.—Collection of plants including Cacti, *Crinum Elwesii*, and *C. Moorei*.

Mr. K. Yashiroda, Fuchisakimura, Japan.—Japanese seeds, including *Pyrus ussuriensis* and *Prunus Davidiana*.

DISTRIBUTIONS OF PLANTS AND SEEDS.—The usual distribution of surplus plants from the various collections was made, either in exchange with botanic gardens, nurserymen, etc., or as gifts to educational institutions. The total number of packets of seeds distributed was :—hardy trees and shrubs, 2619, hardy herbaceous plants, 4608. The most important seeds specially distributed were *Astrebla pectinata*, *Pinus Armandii*, *Leschenaultia biloba*, *Dendrocalamus sikkimensis* and *Pinus monophylla*.

Wardian cases of plants were despatched to the Botanic Gardens of Singapore and Peradeniya, Ceylon. Other Wardian cases were sent to the Departments of Agriculture at Brisbane; Salisbury, Rhodesia; Accra, Gold Coast; Seychelles; Bathurst, Gambia; and to the Amani Institute, Tanganyika Territory.

The recipients of plants, etc. from Kew included the following :—Arnold Arboretum.—Plants and seeds of hardy trees and shrubs. Cambridge, Botanic Garden.—Greenhouse and tropical plants and seeds.

Dublin, Trinity College.—Plants of *Mesembryanthemum Bolusii*. Edinburgh, Royal Botanic Garden.—Plants and seeds, including *Hibiscus Waimeae* and *Nepenthes Thorellii*.

Glasgow, Botanic Garden.—*Nepenthes* spp.

Glasnevin, Botanic Garden, Dublin.—Plants, seeds and cuttings, including *Ilex paraguayensis*.

Harvard University Botanic Gardens, Cambridge, Mass., U.S.A.—Seeds of *Alstroemeria* spp., and *Victoria regia*.

Trinidad, Dept. of Agriculture.—Plants of *Derris elliptica*.

U.S. Department of Agriculture, Washington.—Plants, seeds, grafts and cuttings, including *Prunus Zabeliana*, *Aesculus chinensis*, *Berberis* spp., and *Tilia intonsa*.

Zurich, Botanic Garden, Switzerland.—Plants of *Nepenthes* spp., including *N. Rafflesiana* var. *Hookeriana*.

Mr. F. R. S. Balfour, Dawyck.—Hardy trees and shrubs, including *Nothofagus Dombeyi*.

Mr. B. J. Beckton, Manchester.—A collection of orchids, including *Sobralia Lowii* and *Disa luna*.

Mr. C. A. Benn, Leominster.—Cuttings of *Populus* spp.

Rev. A. T. Boscawen, Cornwall.—Trees and shrubs, including *Myrtus Ralphii*, and *Nothofagus Dombeyi*.

Col. Stephenson Clarke, Cuckfield, Sussex.—Trees and shrubs, including *Styrax Veitchiorum* and *Carpinus Turczaninowii*.

Madame Daigremont, Soisy-sous-Montmorency, France — A collection of *Sedum* spp.

Hon. Vicary Gibbs, Aldenham House, Elstree.—Trees and shrubs.

Dr. J. Goffart, Agla, Tangier.—Seeds of *Acacia* spp.

The Marquis of Headfort, Kells, Co. Meath.—Trees and shrubs.

Capt. C. Ingram, Benenden, Kent.—*Prunus* spp., and *Rhododendron hippophaeoides*.

Lord Lambourne, Romford.—*Nymphaea* spp.

Sir W. Lawrence, Dorking.—Stove and greenhouse plants, including *Begonia Pearcei*.

Mr. G. W. E. Loder, Ardingly.—Trees and shrubs, including *Rhododendron burmanicum*.

Sir F. W. Moore, Rathfarnham, Co. Dublin.—A collection of hardy trees, shrubs and alpine, including *Camellia theifera*, *Salix Bockii* and *Primula Heeri*.

Mrs. Hope Nelson, Lake Como, Italy.—Collection of seedling *Rhododendron* spp., including *R. fictolactum* and *R. fulvoides*.

Lt.-Col. E. R. Pratt, Downham, Norfolk.—Cuttings of *Populus* spp.

Hon. Mrs. Ryder, Brockenhurst.—Seeds and bulbs of *Lilium* spp.

Major F. Stern, Goring-by-Sea, Sussex.—Hardy trees and shrubs.

Sir O. E. Warburg, Epsom.—Hardy trees and shrubs.

Mr. E. H. Wilding, Stoke Poges.—Plants of *Enkianthus* spp. and *Arctostaphylos Manzanita*.

NATIONAL PINETUM AT BEDGEBURY.—Notes on the inception and progress of this new enterprise have already appeared in the *Kew Bulletin* for 1924, p. 113, and in that for 1925, p. 293. In the latter note it is recorded that 315 species and varieties of *Abies*, *Tsuga*, *Pseudotsuga* and *Larix* were planted at Bedgebury in March, 1925. It is satisfactory to be able to record that nearly all these have succeeded well, especially as they had to encounter a dry period in May and June. A man was sent from Kew to give them some attention in the matter of watering and mulching at that time, and this, no doubt, helped them to tide over a critical period. At any rate very few have failed, these being chiefly plants too large or too badly rooted to transplant with safety.

It was hoped that in the present *Review* we should have been able to record the practically complete planting of the whole area. Arrangements had been made at Kew to have about 1,700 young trees delivered and planted in October. Unfortunately our partners in the undertaking, the Forestry Commission, were unable to fulfil their part of the work and get the ground ready for us by that time. This was owing chiefly to difficulties experienced in getting the merchants to whom the timber growing on the site had been sold to clear it away. It is, however, confidently anticipated that, given favourable weather, the present season's planting will be finished in March. This will complete the planting of the main bulk of the pinetum. The addition of new, rare or missing species will, of course, have to continue indefinitely as occasion offers.

In early June last, at the invitation of the Director, a party of distinguished amateurs interested in the Coniferae, together with representatives from the Ministry of Agriculture, the Forestry Commission and Kew, visited and inspected the site. The opinion was unanimously expressed that it would be difficult to find a better one. It is, indeed, a matter for congratulation that we have been able to secure an area so suitable in regard to soil and climate, so adequate in point of size, and possessing such natural beauty.

RAINFALL RECORDED AT THE ROYAL BOTANIC GARDENS, KEW,
DURING 1925.

Inches.				Inches.			
January	...	...	1·60	July	...	...	3·40
February	...	...	3·33	August	...	...	2·44
March	...	...	·46	September	...	...	2·31
April	...	...	1·74	October	...	...	2·98
May	...	...	2·14	November	...	...	1·45
June	...	...	·04	December	...	...	2·62

Total 24·51 inches.

The Museums.

During the past year numerous enquiries bearing upon Economic Botany have been dealt with, and a varied assortment of products received for determination and report. In this connection, where critical microscopical examination has been found to be necessary, much valuable assistance has been rendered by the Assistant Keeper of the Joddrell Laboratory. Although the material received is often of a scrappy nature, it is gratifying to be able to report that it is rather the exception than the rule to meet with a negative result. These enquiries range from the determination of often unfamiliar timbers, barks, dyes, tans, drugs, fruits, seeds, etc., to the examination of various products, as cattle and poultry foods suspected of containing dangerous ingredients. In addition to the correspondence handled many personal enquiries have been made at the Museums by representatives of commercial firms, students and planters seeking information and suggestions as to suitable economic plants for experimental cultivation in many of our Colonies and possessions.

The duties in connection with securing and the subsequent removal of the various collections made over to the Museums from the Wembley Exhibition, followed by the preparation of the material for incorporation in the permanent collections, has rather disorganised other Museum duties; however, the bulk of the material received has now been checked, labelled and placed in position. It is to be regretted that the Timber Museum is so crowded with specimens that it is impossible to display them adequately, and it is greatly to be hoped that at no distant date it will be found possible to extend the building so that the many new timbers appearing in commerce and the material received from Wembley may be exhibited to the best advantage.

Duplicate products have been distributed to the Botany Department, Marischal College, Aberdeen ; The Education Department, Wimbledon ; The University, Riga, Latvia ; University of British Columbia, Vancouver ; The Government Research Institute, Taihoku, Formosa, etc.

During the year special exhibits were made of Ramie (*Boehmeria nivea*, var.) and Portraits of early Botanists with plants commemorating their names, and a series of photographs of *Cupressus macrocarpa* taken under natural conditions. The Ramie exhibit included stems grown at Kew, cleaned fibre, fibre in various stages of manufacture and a wide range of textiles manufactured from the fibre. The textiles included dress fabrics, damasks, plushes and lace. The portraits of botanists and plants exhibit was brought together more particularly for the information of students visiting Kew for a course of botanical instruction during the month of August. The *Cupressus* exhibit illustrated the gnarled condition of the tree in its restricted natural habitat.

PRESENTATIONS TO MUSEUMS.—The following are the chief donations to the Museums since those previously recorded in the *Bulletin* :—

Superintendent, Royal Naval Cordite Factory, Holton Heath.—Four photographs of Cotton fibres. Also samples of Ramie fibre prepared from stems grown at Kew.

Superintendent, Forest Products Laboratories of Canada, Montreal.—A collection of hand specimens of Canadian Woods.

Director of Agriculture, Seychelles.—Samples of plaiting used locally in the manufacture of hats.

Messrs. Westbury and Son, Ltd., Borough, S.E. 1.—Carved Bamboo stem and a specimen Whangee Cane from Japan.

Mrs. W. Goldring, Cheam, Surrey.—Ornamental clock with pedestal of carved Indian Timbers, presented to the late Mr. William Goldring by his Highness the Gaekwar of Baroda, during January, 1893.

Messrs. Kepston, Ltd., Berkhamsted.—Hand specimens of wood of Celery-topped Pine and Australian Myrtle, also model of Kepston Ironing-board.

Mr. C. Coltman-Rogers, Bucknell, Salop.—Cones of *Abies Forrestii*.

Sir Stewart Stockman, Veterinary Laboratory, New Haw, Weybridge.—Samples of Seeds of *Lathyrus sativus* and *Lychnis Githago*.

Mr. S. Maugham, Southampton.—Photograph of a fasciated stem of *Ranunculus sceleratus*.

Mr. G. B. Hinton, Mexico.—Twenty-one photographs of Mexican Pines.

Mr. G. M. Ryan, Notting Hill.—Specimens of water-yielding plant *Calycopteris floribunda*, received from Bombay.

Director of Forests, Ibadan, Nigeria.—Wood and pods of Ambatch Tree (*Herminiera Elaphroxylon*) from Lake Chad.

The Rt. Hon. the Earl of Powis, Powis Castle, Welshpool.—Planks of *Abies pectinata* and *Pinus Jeffreyi*.

Miss L. Frere, Westbourne Terrace, Hyde Park.—Framed water-colour drawing of a Date Palm in blossom.

Mr. E. Braunton, California.—Eight photographs of *Cupressus macrocarpa*.

The late Mr. J. S. Gamble.—A collection of hand specimens of Indian timbers.

Mr. A. Wigglesworth, Trinity Square, London, E.C.—Sample of Sisal Hemp prepared by the Amboni Estates, Ltd., on the East Coast of Africa.

Agricultural Department, Gold Coast, per Mr. F. N. Howes.—Two fuel brickettes manufactured from the pericarp fibre and shells of the African Oil Palm.

Mr. A. Bruce Jackson, The Avenue, Kew Gardens.—Enlarged photograph of a Sweet Chestnut tree at Deepdene, Dorking.

ADDITIONS TO THE MUSEUMS FROM THE BRITISH EMPIRE
EXHIBITION, WEMBLEY, 1924 AND 1925.

India.—A valuable addition to the collections is the fine model of an Indian Lac Factory from the Bihar and Orissa Court, presented by the Indian Lac Association for Research. This model is placed near the entrance door of Museum I. A case of various forms of Lac presented by Messrs. Mahaderprasad Kashiprasad, of Calcutta, will be incorporated in the Lac Collection in Museum I.

Malaya.—Of special importance among the products secured from this section is a comprehensive set of Timber specimens together with photographs and drawings of the trees, also drawings and dried plants of Rotans (*Calamus* spp.), Guttas, Jelutong, a series of Dammars and many other miscellaneous products.

Sarawak.—A mounted series of photographs, illustrative of the Sago Industry, placed in Museum II., also samples of Jelutong Cutch and a Dyak Hunter's Outfit.

Cyprus.—A small collection of Indigenous timbers.

Palestine.—Various products including a series of Dyes, Tans and Agricultural produce together with a mounted exhibit illustrating silkworms fed upon leaves of the Castor Oil Plant.

Zanzibar.—Samples of Cloves, Nutmegs, Pepper (*Piper nigrum*), Cola Nuts, Chillies, Copra also Matting and Rope of Coconut Fibre, Turmeric, Mangrove Bark, Cassava, etc.

Tanganyika Territory.—Included in an interesting collection of products received from this Court the following may be noted :—Sisal Hemp cordage and matting, and samples of various other fibres, Seeds and Oil of *Telfairia pedata*, Cinnamon bark, Camphor crystals, Areca fruits and nuts, Cinchona barks, Rubber Samples and other valuable products from the Amani Institute.

Uganda.—A valuable series of Fibres, Samples of Coffee, Tea, Oil-seeds, Kapok, Soya Beans, Photographs of economic plants, etc.

Kenya.—Specimens of Indigenous Fibres, Wattle bark, Sugar Cane and Sugars, Cotton, Flax, Coffee, Tobacco, Kapok, Spanish

Chestnuts and Acorns of *Quercus sessiliflora* grown in the Nakuru District.

Sudan.—A collection of Gum Arabic, Fruits and Seeds of the Doum Palm (*Hyphaene Thebaica*) and buttons made from the Kernels, Cotton, Plank of Mahogany (*Khaya senegalensis*), Log of Ambatch (*Herminiera Elaphroxylon*), Hand specimens of Woods, Oil of Heglig (*Balanites aegyptiaca*), etc.

Sierra Leone.—From this Court a considerable amount of material was obtained, including Timbers, Copals, Oil-seeds and Oils, Dyes, Tans, etc. Also a native dugout River Canoe, which has been placed upon the Lake by the Palm House, and a small Kroo Canoe, which is exhibited in Museum III.

Gold Coast.—Amongst other general produce obtained from this section the following may be noted:—Fibres, Oil-seeds and Oils, Rubbers, Cinnamon, Cocoa, Kola nuts and a Helmet made of Ambatch Wood (*Herminiera Elaphroxylon*).

Nigeria.—Samples of Fibres, Dyes, including *Indigofera arrecta*, Rubbers, Pulses, Ground Nuts, Cotton and a log of Mangrove Wood (*Rhizophora racemosa*).

Union of South Africa.—A large and valuable collection of photographs of S. African vegetation and samples of Timber from Swaziland.

Canada.—Many sections of Timber including a fine log and planks of Douglas Fir, Western Red Cedar, etc. Manufactured articles of Wood and a series of specimens illustrating the wood-pulp industry.

Jamaica.—Sections of Timber, Trunks of Logwood and Fustic, Section of stem of a Camphor Tree and many other products, also a large collection of Photographs of economic plants.

Trinidad.—The products obtained from this Court include samples of Para Rubber, Cocoa, Coconuts, Copra, Coir fibre, rope, etc.

St. Lucia.—Various miscellaneous products including sections of timber of *Cedrela odorata*, *Pimenta acris* and *Mimusops globosa*, also various pulses, Nutmegs, Kola seeds, Cinnamon, etc.

British Honduras.—Samples of indigenous timbers.

British Guiana.—A large and miscellaneous collection of products of which the following may be noted:—Balata Soleing and Machine Belting, several utensils made of Balata, also Belt and Rope for climbing Balata trees, Samples of Rubber, Fruits, Food materials, models of a Keg and Vat, Paling Staves and Roofing Shingles of Wallaba Wood (*Eperua falcata*).

New Zealand.—Specimens of Fibre Cord and Binder Twine of New Zealand Hemp (*Phormium tenax*) and a few planks of Native timbers including Kauri Pine (*Agathis australis*), Totara (*Podocarpus Totara*), Rimu (*Dacrydium cupressinum*), etc.

In addition to the foregoing many examples of Timber and manufactured articles were generously donated to the Museums by various firms and private exhibitors in the British Forestry Section.

The Jodrell Laboratory.

Numerous specimens of wood and other plant products were examined microscopically, and identified as far as possible by the anatomical method. These were, in most cases, samples representing products of economic interest; a series of ancient Egyptian specimens of wood was also examined. The Assistant Keeper was chiefly engaged in work of this kind, but also paid some attention to cases of foliage injured by smoke, and made further experiments on the germination of spores.

Mr. R. N. Chrystal continued his researches on the species of *Chermesidae* parasitic on the Silver Fir. These dealt with the effects produced on the tissues of the host-tree as a result of attack, and interesting comparisons were made of the different effects produced on various species of Silver Fir (Phil. Trans. R.S. Lond. series B: 214, p. 29). Further studies were also made upon the nature of the cell-contents in abnormal tissues, produced as a result of attack.

Mr. G. H. Jones carried out an experiment with young Cotton plants, with the object of finding out whether any pathological effect would be caused by excessively heavy watering.

Miss M. E. Odell examined the epidermis of the leaves of a number of living plants for purposes of comparison with the epidermis of leaves of fossil plants found in a Pipe Clay belonging to the Lower Bagshot series.

Five students from the Imperial Forestry Institute, Oxford, under Mr. H. G. Champion, were accommodated in the Laboratory for a short time in July.

By arrangement with the Board of Education a course of instruction for Teachers in Secondary Schools, similar to that held in 1923, was given from August 6th — 14th. The course was again organised by Dr. Harold Wager, F.R.S., and was attended by forty teachers; it included lectures and practical botanical work, for which accommodation was provided in the Lecture Rooms adjoining the Jodrell Laboratory, demonstrations in the Gardens and Museums, and visits to the Herbarium and Library.

Herbarium.

A special effort was made in 1925 to render available for workers further accumulations of unclassified material, especially those housed in the Stores. Sanction for the special temporary staff for this purpose granted in 1924 was renewed in 1925 and very substantial progress has been made. Owing to the lack of cabinet space on the one hand and lack of time for naming on the other, large temporary and preliminary sortings have had to be arranged both in the Herbarium and in the Stores, but inasmuch as the material thus sorted is available for consultation, such sortings have proved useful and have been appreciated especially by visitors. Further relief was also afforded in 1925 by the appointment of additional regular staff, namely, a permanent scientific assistant for the Index Kewensis, a clerk for bookkeeping and a typist. The post of Assistant Librarian hitherto held by a temporary technical

assistant was moreover made permanent. The extra clerical assistance provided enabled the scientific staff to devote more time to botanical work.

In order to meet the demand for extra cabinet space a scheme was evolved whereby additional floor accommodation could be secured apart from the building of a new wing. This was accomplished by uniting the hitherto separate cabinets into a single carcase, thus allowing the insertion of two pairs of additional cabinets in each block, i.e., 64 shelves. To permit of this all the old cabinets have to be emptied and their doors are being rehung with "butterfly" hinges. Further shelving may be added later as an upper storey to each block of cabinets. The work was put in hand in November and the completion of the whole will take upwards of three years.

In order to carry out the above alterations it was first necessary to rearrange the entire heating apparatus. The cumbersome four-inch pipes were replaced by a more modern method, namely the "drop system" in which small radiators placed below the windows are connected by vertical pipes, thus allowing the cabinets to be placed right up to the wall. Radiators have also been installed in the Herbarium Storehouse which during the past winter was temporarily heated by gas fires. The re-decoration of both wings of the Herbarium, last carried out in 1904, was commenced and is to be completed early in 1926.

These extensive structural alterations have caused considerable inconvenience to the Herbarium staff and their work has often been carried out under difficulty.

EUROPE.—*Routine*.—Considerable time has been spent in the incorporation of new material and in the re-arrangement of that already existing in the Herbarium. With regard to the latter, special attention has been paid to the writing up, according to monographs, of important genera. The most noteworthy of these was *Hieracium*, which has been arranged according to Zahn's monograph. Approximately 4,000 additional sheets of this genus were extracted from the Stores, mainly from the Churchill and Willmott collections. These have been written up and incorporated so that the genus *Hieracium* is now represented by a very fine series of properly arranged specimens. Similar work has been carried out with *Taraxacum* using Handel-Mazzetti's monograph. Amongst other genera which have been re-arranged mention may be made of *Geum*, *Verbascum*, *Veronica*, *Thesium*, and the whole of the European *Labiatae* with the exception of *Thymus* and *Ajuga*. The arrangement of *Centaurea* and *Linaria* has also been commenced.

The entire collection consisting of 778 specimens from Bosnia and Herzegovina made and presented by Dr. K. Maly has been mounted and laid in, and also about 10,000 sheets from the Store. Several thousand others have also been mounted, but these, owing to the shortage of cabinets, have only been temporarily sorted.

Opportunity was taken of the re-arrangement of cabinets to lay in the collection of Conifers received from the late Dr. Maxwell

Masters, which had hitherto been kept separate in its own cabinet. The collection (which naturally included extra-European material), contained many interesting specimens as well as notes on plants referred to in published papers by Dr. Masters.

The Rev. E. Ellman kindly invited one of the Temporary Assistants to accompany him on a month's collecting expedition to the Pyrenees, and, as a result of this, some 290 interesting or critical Pyrenean plants have been added to the Herbarium.

Research and Publications.—Two papers dealing with the European flora were published during the year, namely, "Notes on the Flora of the Balkan Peninsula" (*K.B.*, 1925, p. 34), and on "The Flora of the Varna District, East Bulgaria" (*Journal of Botany*, Vol. 43, p. 157).

ASIA.—Routine.—A very large amount of material has passed through the hands of the Assistant for India. Plants received from the Imperial Forest Botanist at Dehra Dun and the Forest Botanist, Burma, together with a large collection from the Palni Hills, received from the Rev. A. Saulière and the Rev. L. Anglade have been named, mounted and laid in. The whole of the Duthie Herbarium has been mounted and a further instalment has been incorporated. Owing to the frequent handling of the Wallich Herbarium a very large number of specimens had become partially detached. With the aid of a grant from the India Office it has been possible to put an experienced mounter on the work of restoring the sheets, and about a third of this work has now been completed. Of the donations received mention must be made of the magnificent herbarium of the late Mr. J. S. Gamble (*see K.B.*, 1926, p. 12). This will be incorporated, in accordance with Mr. Gamble's express wish, as soon as possible, but, owing to the congested state of the Herbarium, no attempt was made to do so during the past year. With the additional cabinet space available a commencement was made with the *Gramineae* in the Gamble Herbarium on January 1st, 1926. The whole of this herbarium therefore has been stored in Mr. Gamble's own boxes in the cellar and, being fully labelled, is available for consultation.

In the Chinese Section the principal work during the year has been the re-arrangement of genera and the naming of collections. The major portion of Père E. Licent's collection from Northern China, including some 2,700 plants, has been identified and the names have been sent to him to The Hoang Ho Pai Ho Museum, Tientsin. The herbaceous *Leguminosae*, collected by J. F. Rock in South West China and on the Tibetan border, have been determined and the list forwarded to the U.S. National Museum. The valuable collection made by Capt. F. Kingdon Ward in South-West Tibet during 1924 and presented during 1925 has been largely worked out. It has been found to contain a large number of novelties and the diagnoses of many of these have been drawn up. A further consignment of Forrest's plants, 1921-22, consisting of close on 2,000 sheets, was received from the Royal Botanic Garden,

Edinburgh. These have been laid out and mounted and about 1,600 have been labelled by cutting up a copy of the catalogue of Forrest's plants published in the Notes of the Royal Botanic Garden, Edinburgh. Owing to the large amount of laying in accomplished last year most of the available cabinet space for Chinese material has been filled. Much of the named material when mounted is therefore temporarily sorted into families.

Further collections received from Siam, from Dr. A. F. G. Kerr, have been identified by Prof. W. G. Craib and some 300 Siamese grasses have been named at Kew. As far as possible all Siamese material is laid in, and in particular all the new species.

Accumulations of material in the Store from the Malay and Philippine Islands have also been dealt with and a preliminary sorting has been carried out. About 80 bundles of named specimens from the Malay Islands were sorted and the unmounted sheets arranged in genus and species covers and replaced in the Asiatic Room in the Store. Some 200 bundles of named Philippine Islands material are being treated in the same way. In each case examples of new genera and species are taken out and laid in and any duplicate material is set aside for distribution.

Research and Publications.—Work was continued on the revisions of the Chinese species of important horticultural genera. The ms. of those on *Cotoneaster* and *Pyracantha* has been prepared and progress has been made with the revisions of *Buddleia* and *Gentiana*.

AFRICA.—*Routine.*—The principal work has consisted in naming East African material. This included numerous collections received from the East African Colonies during the year and the very large Stolz collection from Tanganyika in the Store, which was commenced last year. The latter was completed and the duplicates have been distributed. A considerable amount of West African material was also dealt with, including about 450 sheets received on loan from Paris for citation in the Flora of West Africa. In the same connection Thomas's Sierra Leone collection is being gradually worked up and duplicates prepared for distribution. In the Store all the Mildbraed plants from the Cameroons, and Gossweiler's plants from Angola have been laid out and mounted.

The revision of the material of *Compositae* for the Pretoria Herbarium was continued, and also a large number of sheets of the same family from the Transvaal for Prof. C. E. Moss. All the African specimens of the Angraecoid orchids have been arranged according to Dr. Schlechter's "Natürlichen Neuordnung." Over 600 specimens of grasses from various parts of Africa were determined. Many of these were received in small consignments and needed critical examination. The African material of the first 30 genera of the *Gramineae* is now completely arranged according to Dr. Stapf's arrangement in the Flora of Tropical Africa.

Research and Publications.—In connection with the Flora of West Africa, now in preparation, the Herbarium of the Museum

d'Histoire Naturelle, Paris, was visited in order to examine the wealth of material there and the many type specimens in Dr. Chevalier's herbarium. The first part of the Flora, after incorporating the notes made during this visit, has been completed and prepared for press. The Flora follows the arrangement set out in Hutchinson's "Families of Flowering Plants" and contains an analytical key to all the families represented in West Africa and about 100 drawings. The families dealt with include some of the most difficult such as *Anonaceae*, *Guttiferae*, *Combretaceae* and *Melastomaceae*.

In order to assist agriculturists in East Africa a small booklet containing illustrations and descriptions of common pasture grasses has been prepared and is now in the press. The following papers dealing with African botany were also published:—"Notes on Cyperaceae" (*K.B.*, 1925, p. 67), and "A revision of the genus *Cassipourea*" (*K.B.*, 1925, p. 241).

AMERICA.—*Routine*.—The determination of the various Mexican collections in the Store, including those of Palmer, Langlassé, Hancock and others, was practically completed during the year. A considerable portion of the material has been incorporated in the Herbarium, where, since many of the species were previously unrepresented, they will prove most valuable. In the case of the South American collections in the Store preference was given to BRITISH GUIANA, and two large collections received respectively from the Botanic Gardens, Georgetown, and the Department of Science and Agriculture, British Guiana, were determined. Various collections from COLOMBIA were also determined. Altogether over 4,000 specimens were named and over 21,000 specimens were laid in during the course of the year. Considerable progress was also made in the American Section of the Herbarium in the writing up and arranging of genera in accordance with recent monographs and revisions, those belonging to the *Euphorbiaceae*, *Urticaceae*, *Rubiaceae* and *Compositae* especially being dealt with. Many of Glaziou's Brazilian plants, which previously were only named generically, have, with the help of the systematic list of his collections, been specifically determined.

Research and Publications.—Amongst the investigations undertaken were the revision of the genus *Ryania*; an investigation into the botanical identity of the Brazil nut of commerce; and the analysis of Linden and Planchon's extremely rare work entitled "Plantae Columbianaë" with identifications of the new species described therein (*Kew Bulletin*, 1926, p. 32). Fully indexed itineraries have been prepared and published of Humboldt and Bonpland's travels in Venezuela (*K.B.* 1925, p. 295), and those on the travels in Colombia, and in Ecuador and Peru, are in the press. These itineraries have proved most helpful in the identification of material from Northern South America.

In connection with the proposed 'FLORA OF TRINIDAD AND TOBAGO,' the identifications of the *Rubiaceae* recorded in the

literature from those islands were investigated, with the result that at least 10 per cent. of the species listed were found to be wrongly determined. This work occupied a considerable amount of time and involved a large amount of taxonomic and bibliographical research. It was found that the flora was very inadequately represented even in the great Herbaria of the world and that many of the genera were greatly in need of revision.

AUSTRALIA AND POLYNESIA.—Routine.—The routine in the Australian Section was interrupted by the appointment of the Assistant in charge (Major K. W. Braid) to be Professor of Botany of the West of Scotland Agricultural College. The work is being carried out by his successor, and it is satisfactory to record that not only have the small collections received from all parts of the Commonwealth of Australia and the Dominion of New Zealand been dealt with, but a commencement has been made with the material in the Store.

A special attempt was made to deal with the large supplies of FIJIAN plants, forwarded at intervals by Mr. W. Greenwood from Fiji, but owing to special difficulties the work proceeds slowly.

The collection of NEW GUINEA orchids received from the late Dr. Schlechter has been laid in and the opportunity taken to arrange the New Guinea material of *Bulbophyllum*, *Calanthe*, and *Taeniophyllum* and other genera in accordance with Dr. Schlechter's "Die Orchidaceen von Deutschen Neu Guinea."

Research.—A paper entitled "A revision of the Genus *Alphitonia*" was published in the *Kew Bulletin*, 1925, p. 168. In response to a request from Mr. C. T. White, preparations were made to revise the Australian species of the genus *Aristida*, and a considerable amount of material was collected together from the various botanical departments in the Commonwealth. It was learned, however, that the entire genus was being monographed by Dr. Henrard, of Leiden, and all the material was therefore forwarded to him. A considerable number of new species of *Frankenia* have been detected in the Herbarium and a revision of all the Australian species of the genus has been commenced.

VASCULAR CRYPTOGRAMS.—Owing to the pressure of work on important economic groups, the *Pteridophyta* and *Bryophyta* have necessarily been much neglected for many years and it is satisfactory to record that as a result of additional assistance for clerical work Mr. C. H. Wright has been able to devote considerable time to the naming and laying in of the ferns, and to continue writing up the collection according to Dr. C. Christensen's "Index Filicum." The latter, however, will entail much time, as many critical forms will have to be separated out from old composite species. Large accumulations of ferns exist in the Store and an even greater number of *Bryophyta*, but it is hoped now gradually to take in hand the naming of these collections. Some 1,500 tracings of Stephani's drawings of *Hepaticae* were laid in, which, representing as they do so many rare and type species, are of great value.

THALLOPHYTA.—*Routine*.—Several collections of Marine Algae were laid in and a certain number of Lichens. A commencement was also made with the re-arrangement of the boxes of the saxicolous Lichens according to Zahlbruckner's monograph, a lichenologist, Miss D. Powell, being specially employed for the purpose.

In the Mycological section a most valuable collection was received from Mr. T. Petch, consisting of nearly 2,500 specimens of Ceylon fungi collected and named by him, many of them being types or syntypes. A number of miscellaneous additions have also been received, including an interesting collection of New Zealand rusts and smuts, presented and determined by Mr. C. H. Cunningham. Though partly incorporated the laying in of these collections has been held up through lack of space, but the over-crowding has now been relieved by the addition of the new cabinets in each bay. In connection with the routine work of the mycological section, acknowledgments are due to Mr. C. G. Lloyd, who, during his absence from England, has for the second year kindly allowed his typist to be employed for about three-quarters of her time on Kew work.

Research and Publications.—A critical examination and partial naming of a collection of species of *Poria* from Australia was undertaken and a revision was prepared of the recorded species of *Cystopus* from South Africa; the latter account will shortly be published in *Bothalia*. A list has also been drawn up, and will be published in the *Kew Bulletin*, of the fungi known to occur in Kenya Colony, the list being based on published records and on a critical revision of the material in the Herbarium. Additional apparatus for mycological investigation has been installed in the Jodrell Laboratory, and, with the aid of this, further research has been undertaken in connection with the biology of *Cercospora Antirrhini* Wakef. and *Rhizoctonia crocorum* DC. and with taxonomic investigations of the genus *Vermicularia*.

STOREHOUSE.—The work of the special Store staff which consists of four botanists and eight preparers was, as in 1924, distributed on a geographical basis, a botanist with two preparers being assigned respectively to the European, Asiatic, African and American rooms in the Storehouse. During the year under review the work of laying out, mounting and poisoning has proceeded satisfactorily and at a slightly higher rate than for the five months during which the staff was employed in 1924. Excellent progress was made by the botanists in their tasks of sorting named material, determining the unnamed, and in the laying in of the sheets. Owing to the congestion in the Herbarium pending the installation of new cabinets, much of the material dealt with had to be temporarily arranged on shelves in the Store. The work carried out by the special staff is included under the geographical headings already dealt with.

SUMMARY OF ROUTINE.—The following table summarises the routine work accomplished by the regular staff and by the special Store staff during 1925, the lower Cryptogams being excluded :—

Laid out	Approx.	77,600
Mounted	...	92,310
Incorporated in the Herbarium	...	44,243
Duplicates distributed	...	20,409
Specimens received on loan	...	7,077
Specimens sent out on loan	...	6,001

SEED AND CARPOLOGICAL COLLECTIONS.—About 300 samples have been added to the seed collection during the year and about 100 samples to the carpological collection. All the additional material is incorporated and both collections are now in good order. The value of a separate seed collection for the purpose of naming has been much emphasized during the identification of samples from various parts of the world, when the great rapidity in matching genera and species as compared with using herbarium sheets is very striking.

NOMENCLATURE.—Numerous enquiries from various institutions and from botanists, with reference to the names which should be adopted in particular cases under the International Rules of Nomenclature, have been dealt with, and answers have been sent to many questions connected with orthography and bibliography. Among the subjects which have received attention are those of "nomina conservanda" and "standard-species." The Committee on Australian Botanical Nomenclature, appointed by the Australasian Association for the Advancement of Science in 1924, communicated reports of their proceedings, and a précis which was published (*Kew Bull.* 1925, p. 343, and *Journal of Botany*, 1925, p. 210), in order that the proposals of the Committee may be accessible to botanists in other parts of the Empire and in foreign countries, and also may receive adequate consideration before the International Botanical Congress to be held at Ithaca in August, 1926.

It is gradually becoming recognised that in order to secure certainty in the application of generic names, each of these should be associated with a definite species, the so-called "standard-species." An investigation into the standard-species of the Linnean genera of *Tetradynamia* (*Cruciferae*, with the genus *Cleome*) was published in *Kew Bull.* 1925, p. 49, standard-species being proposed for the thirty-one generic names concerned. As a result of valuable constructive criticism received from Prof. Thellung, further examination was given to the cases of *Lepidium* and *Biscutella*, and the standard-species proposed for these names were altered. The thirty-one species now recommended may be regarded as free from objection (*K.B.*, 1925, p. 315).

INDEX KEWENSIS.—Steady progress has been made during 1925 with the printing of the sixth Supplement to the *Index Kewensis*, covering the period 1916-1920. The first sheet of proof was received from the press in February, 1925, and six-sevenths of the

work (24 sheets out of 28), comprising the genera *Aa-Senecio*, were in print at the end of the year. It is anticipated that the volume will be published in the first half of 1926.

The compilation of the seventh Supplement has been progressing simultaneously with the printing of the sixth, and by the end of the year 1925 it comprised about 9000 separate entries. The seventh and following Supplements will not only be printed in book form as heretofore, but will be preserved at Kew as a card-catalogue, a form which will enable the successive Supplements, as they appear, to be sorted into a single alphabetical series, thus greatly facilitating consultation. The preparation of Supplement VII concurrently with the printing of Supplement VI was made possible by a grant from the British Association for the Advancement of Science and by special facilities afforded by the Council of the Royal Horticultural Society. It is also satisfactory to record that a permanent post of assistant for the Index Kewensis was created and filled (*see Kew Bulletin* 1926, p. 142).

Three further instalments of "Additions to the Index Kewensis" were published during the year (*K.B.*, 1925, pp. 186, 311, 344), relating respectively to names which appeared for the first time in Crantz, *Classis Cruciformium* (1769), and in Vellozia, ed. 1 (1888) and ed. 2 (1891), and to others generally regarded as "nomina nuda," but which were validated by description in G. Don's General System. During the three years 1923-25 the number of supplementary entries made relating to the period covered by the original Index Kewensis and the first five Supplements amounted to about two thousand.

EXPERIMENTAL GROUND.—The new plot to the west of the Herbarium was prepared for use in the spring and during the year 200 species were cultivated in it. The value of such a plot to the systematic botanist can hardly be over-estimated. In every country there exist genera with a multitude of forms the true nature of which baffles the systematist, and these often differ from those of neighbouring countries. It is only by growing such plants under uniform conditions and studying them in the living state, with due regard to such questions as segregation and the stability of characters, that the taxonomist can hope to make any progress on sound lines.

The plants grown in 1925 were mostly from Spain and the Balkan Peninsula, derived from seeds collected during visits by members of the staff or received subsequently as a result of such visits. A number of critical species of some dozen genera were studied in the living state and in their various stages of growth. Several of these proved to be totally unrepresented in the Herbarium, including the following which were new:—*Veronica pontica* Turrill, *Dianthus* sp. nov., *Verbascum luteo-viride* Turrill, and *Verbascum Blattaria* var. *luxurians* Turrill, whilst two other species were sufficiently important to be figured for the Botanical Magazine. About 250 sheets of specimens were dried, mounted and laid in, in addition to other sheets which were prepared for exchange purposes.

Inheritance and hybridization-phenomena were studied in *Centaurea* "diffusa," *Galeopsis Tetrahit*, and *Solanum dulcamara*. Work on the first-named will be extended and several varieties and strains have been collected.

Another function served by the experimental plot was manifested during the year, namely distribution to scientific workers of seeds of plants of critical species from definite wild localities. The superiority of such material to that supplied by ordinary garden plants for geneticists and other investigators is becoming increasingly apparent.

VISITORS.—About 5770 visits have been made to the Herbarium during the year. Amongst those who have paid frequent visits or made a prolonged stay were:—Alston, Mr. A. H. G., Dept. of Agriculture, Ceylon (Revision of *Cassipourea*); Babcock, Prof. E. B., University of California (Genetics of *Crepis*); Badami, Mr. V. K., Cambridge (*Arachis hypogea*); Baker, Mr. E. G., British Museum (African *Leguminosae*); Blake, Dr. S. F., Dept. of Agriculture, Washington (American *Compositae*); Bolus, Mrs. L., Bolus Herbarium, Cape Town (*Mesembryanthemum*, *Watsonia*); Brown, Mr. N. E. (South African plants); Buller, Prof. A. H. R., University of Manitoba, Winnipeg (Mycology); Burkill, Mr. I. H. (Malay Peninsula plants); Burt-Davy, Dr. and Mrs. J., Imperial Forestry Institute, Oxford (Flora of the Transvaal); Chandler, Miss M. E. J. (Fossil seeds and fruits); Compton, Prof. R. H., Cape Town (South African and New Guinea plants); Cowan, Mr. and Mrs. A. M., Indian Forestry Service (Sikkim collections); Craib, Prof. W. G., Aberdeen (Siamese plants); Czechtz, Mrs. Hanna, Cracow (Plants of Anatolia); Dastur, Mr. R. H., University College, Reading (Marine algae); David, Mr. A. N., Forest Products Board (Timber Research); Dixon, Mr. H. N., Northampton (Mosses); Erlanson, Mrs. E. W., University of Ann Arbor, Michigan (American Roses); Fawcett, Mr. W., British Museum (Botany of Jamaica); Fedtschenko, Prof. B., Leningrad (Various plants); Fourcade, Mr. H. J., South Africa (South African plants); Fraser, Mr. J., (Garden plants); Gamble, Mr. J. S., Liss (Flora of Madras); Geddes, Miss E. J., Aberdeen University (Siamese plants); Grove, Mr. W. B., Birmingham (Fungi); Guthrie, Miss L., Bolus Herbarium, Cape Town (South African Monocotyledons); Haines, Mr. H. H., Wimborne, Dorset (Indian Botany); Hall, Dr. H. M., University of California (American *Compositae*); Hall, Mrs. Carlotta, University of California (North American ferns); Hall, Mr. L., Messrs. Cross and Bevan's Laboratories (Plant Chemistry); Hauman, Prof. Louis, National Museum, Buenos Aires (Botany of the Argentine); Henry, Prof. A., University College, Dublin (Forestry); Hohenkerk, Mr. L. S., British Guiana Forestry Dept. (Plants of British Guiana); Jackson, Mr. A. Bruce, Kew (*Cotoneaster*); Jones, Mr. E. Marsden, Devizes (Genetics); Kerr, Dr. A. F. G., Bangkok (Flora of Siam); Killip, Dr. E. P., Dept. of Agriculture, Washington (*Passiflora*); Kingdon Ward, Capt. F. (Rhododendrons, Flora of Tibet); Lloyd

Praeger, Dr. R., Dublin (*Crassulaceae*); Magnusson, Dr. A. H., Göteborg, Sweden (Lichens); Mason, Mr. E. W., Imperial Bureau of Mycology (Fungi); Massey, Mr. R. E., Khartoum (Grasses of the Sudan); Moore, Mr. S., British Museum (General Botany); Moss, Prof. C. E., University of Witwatersrand, Johannesburg (Transvaal plants); Osmaston, Mr. A. E., Indian Forest Service (Indian plants); Paulsen, Mr. R., Pinner (Lichens); Perez, Madame, (Bibliography of Canarian Flora); Reid, Mrs. E. M., Milford-on-Sea (Fossil seeds and fruits); Ridley, Mr. H. N., Kew (Plants of Borneo and Sumatra); Riley, Mr. L. A. M. (Plants of "St. George" Expedition); Robyns, Dr. W., Botanic Gardens, Brussels (African *Rubiaceae*); Roffey, Rev. J. (*Hieracium*); Rogers, Rev. F. A. (South African plants); Ryan, Mr. G. M. (Forestry); Salmon, Mr. C. E., Reigate (British Botany); Schindler, Dr. A. K., Jutebog, Germany (Monograph of *Desmodium*); Shabetai, Mr. J. R., Cairo (Flora of Egypt); Simpson, Mr. N. D., Cairo (Egyptian plants); Snelling, Miss L., St. Mary Cray (Botanical Magazine); Stapf, Dr. O. (Botanical Magazine, Pritzel's Index Iconum); Stojanoff, Prof. N., Sofia (Flora of Bulgaria); Westerdijk, Prof. Johanna, Baarn, Holland (Fungi).

The work accomplished by visitors not only contributes to botanical science as a whole but, as the notes below show, is often of direct importance to Kew, especially with regard to the floras of the distant parts of the Empire.

The work of the following visitors was carried out almost exclusively at Kew. Dr. O. Stapf, who throughout the year continued work as editor of the Botanical Magazine and of the new edition of Pritzel's Index Iconum, the former task involving much critical study and revision of genera. Mr. H. N. Ridley has completed the publication of his Flora of the Malay Peninsula, which deals only with the phanerogams (*see K.B.*, 1925, p. 399), and has prepared an account of the ferns, which will appear in the Journal of the Asiatic Society, Straits Settlements Branch. Mr. Ridley has also published an enumeration of the plants collected in Bencoolen, Sumatra (*K.B.* 1925, p. 76). Mr. N. E. Brown published a paper on new species of *Indigofera* from the Transvaal and Swaziland (*K.B.*, 1925, p. 142), and continued his studies on *Mesembryanthemum*, publishing his results periodically in the Gardeners' Chronicle.

Before leaving to take up his appointment as Lecturer in Forest Botany at the Imperial Forestry Institute, Oxford, Dr. J. Burt Davy continued the preparation of a Flora of the Transvaal. Mr. I. H. Burkill, on his retirement from the Directorship of the Botanic Gardens, Straits Settlements, has worked regularly at Kew on plants from the Malay Peninsula, especially *Dioscorea* and on the economic botany of that region.

Of other botanists engaged on important work though for shorter periods mention may be made of Mr. J. S. Gamble, who until his lamented death (*see K.B.* 1925, p. 433), paid regular visits in connection with his Flora of the Presidency of Madras, Part VII

of which was published in Dec. 1925, three months after his death; Prof. W. G. Craib and his assistant, Miss E. J. Geddes, spent some time at Kew on critical work on the Siamese flora, and Dr. A. F. G. Kerr, Director, Botanical Section, Ministry of Commerce, Siam, who determined a large number of the Siamese orchids, which he has been collecting for many years. Additamenta Nos. XV, XVI, and XVII to the Contributions to the Flora of Siam were published in Nos. 1, 9 and 10 of the *Kew Bulletin*, 1925, the last two consist of new orchids (all but one of which were named but not described by the late R. A. Rolfe), and were edited by Miss D. G. Downie. It may be noted further that a separate work entitled *Florae Siamensis Enumeratio* is being published under the auspices of the Siam Society, Part 1 of which appeared in March, 1925. Mr. L. A. M. Riley also paid numerous visits and published three papers dealing with notes on plants of Madeira, of Trinidad and of the Galapagos Islands collected by the "St. George" Expedition (*K.B.* 1925, pp. 26, 133, 216).

Numerous botanists visiting England from the Colonies and Dominions spent a considerable time in the Herbarium, notably Mrs. F. Bolus, Honorary Curator of the Bolus Herbarium, National Botanic Garden, Kirstenbosch, and Miss L. Guthrie, who were engaged on working at South African Mesembryanthemums and Monocotyledons; Mr. R. E. Massey, Government Botanist, Khartoum, who completed his work on grasses for inclusion in the second edition of the Catalogue of Sudan plants, which he is preparing in collaboration with Mr. A. F. Broun; also Prof. C. E. Moss, Prof. R. H. Compton, and Mr. L. S. Hohenkerk of the Forestry Department, British Guiana.

American workers were represented by Dr. H. M. Hall, of the University of California, who worked with various American *Compositae*, and Prof. E. B. Babcock of the same University, who was engaged on a systematic study of *Crepis* with a view to subsequent genetical work. Dr. Hall was accompanied by his wife, Mrs. Carlotta Hall, who dealt with ferns, especially the genus *Pellaea*. North American *Compositae* were also studied by Dr. S. F. Blake of Washington.

Of other notable foreign visitors mention can only be made of Dr. A. K. Schindler, who spent some five weeks at Kew in connection with his monograph of *Desmodium* and its allies for the Pflanzenreich; Prof. N. Stojanoff, who continued his work on the flora of Bulgaria, and Dr. Robyns, who, prior to his expedition to the Belgian Congo, continued his studies on African *Rubiaceae* and prepared a monograph, now awaiting publication, on the genus *Vangueria* and its allies.

ADDITIONS TO HERBARIUM.—The total number of specimens acquired during 1925 was 80,013, of which 3,581 were purchased, the remainder being received as donations or exchanges. The chief sources from which these were obtained were as follows :—

EUROPE.—*Presented*: Britain, by Mr. E. Thurston, Mr. C. E. Salmon, Mr. C. E. Britton, Col. H. H. Johnston, and the

Botanical Exchange Club per Mr. W. O. Howarth; Belgium, by the Jardin Botanique de l'Etat, Brussels; France (coll. Croizette Desmogens), by Mr. J. S. Gamble; Flora Roumaniae Exsiccata, Cent. 2, 4 and 5, by Cluj University; Cryptogamia Exsiccata, Cent. 29, by the Vienna Naturhistorisches Museum; Bosnia, 778 specimens by Dr. K. Maly; Moravia (coll. Podpera) by Brno University; Iter Tanaicense, by Prof. J. Novopokrowsky; Pyrenees, Rev. E. Ellman; Balkan Peninsula, by Mr. and Mrs. Turrill.

Purchased: Mr. D. McArdle, Irish *Charophyta*, etc.; Dr. E. M. Reineck, Central Europe, and *Plantae Europae Orientales*, part 2; Mr. A. A. Grossheim, *Plantae Orientales Exsiccatae*, fasc. 1-8, nos. 1-200.

NORTH AFRICA.—*Presented*: Morocco (coll. E. Jahandiez), by Mr. L. Johnston.

ATLANTIC ISLANDS.—*Presented*: Canary Islands, by Mr. Herman Spooner.

CHINA.—*Presented*: Fukien, 314 specimens by Prof. H. H. Chung; Kansu (coll. R. C. Ching), by the United States National Museum; Yunnan and E. Tibet, 1900 specimens (coll. G. Forrest, 1921-22), by the Royal Botanic Garden, Edinburgh; Yangtze Watershed and Valley, Yunnan (coll. J. F. Rock), by the United States National Museum; Hongkong, etc. (coll. Col. W. Robinson), by Mr. Wellesley H. Robinson; E. Tibet, 712 specimens (coll. Capt. F. Kingdon Ward), by the Royal Botanic Garden, Edinburgh.

Purchased: Canton Christian College, Hainan, coll. F. A. McClure.

INDIA.—*Presented*: India, private herbarium (about 50,000 sheets), by Mr. J. S. Gamble; residue of Johann Peter Rottler's herbarium, by King's College, London (see *Kew Bull.* 1894, p. 200); Madras, by the Royal Botanic Garden, Calcutta, and the Madras Government Herbarium, selected by permission by Mr. J. S. Gamble; United Provinces, by the Forest Research Institute and College, Dehra Dun; Kashmir, by Mr. B. O. Coventry; Ceylon *Fungi* 2,450 specimens including many syntypes, by Mr. T. Petch; seeds, by Mr. B. Gill; Maymyo, by Mr. C. E. Parkinson; Kashgar Mountains, by Mr. C. P. Skrine.

MALAY PENINSULA.—*Presented*: various, by the Botanic Gardens Department, Straits Settlements.

INDO-CHINA.—*Presented*: Siam (coll. Dr. A. F. G. Kerr and Nai Noe), by Dr. A. F. G. Kerr; Siam (coll. Phra Winit Wanadorn), by the Siamese Forestry Service; Siamese Mosses, named by Mr. H. N. Dixon, by Prof. W. G. Craib.

MALAY ISLANDS.—*Presented*: 700 sheets from various islands, by the Buitenzorg Botanic Garden; Borneo (coll. Castro and Melegrito), by Dean E. D. Merrill; Sumatra (coll. H. S. Yates), by Dean E. D. Merrill, and (coll. C. Boden Kloss)

- by the Director, Botanic Gardens, Singapore, and (coll. Robinson and Kloss) by the British Museum (Natural History).
- PHILIPPINES.—*Presented*: (coll. A. Loher and M. Ramos), by Dean E. D. Merrill.
- NEW GUINEA.—*Presented*: (coll. Dr. G. Bryce), by the New Guinea Department of Agriculture,
- AUSTRALIA.—*Presented*: Nowra, New South Wales, by Dr. F. A. Rodway; Western and Northern Australia, by Dr. Herbert Baselow; various, by the Sydney Botanic Gardens.
Purchased: G. Weindorfer, mountains of Tasmania.
- NEW ZEALAND.—*Presented*: various, by Mr. H. Carse.
- POLYNESIA.—*Presented*: Fiji, by Mr. W. Greenwood; Samoa, by Mr. P. A. Buxton; Hawaii, by Mr. I. H. Burkill; Austral Islands, etc., coll. St. George Expedition, by the Scientific Expeditionary Research Association.
- TROPICAL AFRICA.—*Presented*: Southern Nigeria (coll. Mr. and Mrs. A. Talbot), by the British Museum; Angola, by Mr. J. Gossweiler; Belgian Congo, by the Jardin Botanique de l'État, Bruxelles; Uganda, by Mr. J. D. Snowden; Kenya Colony, by the Department of Agriculture and the Forestry Department, and by Drs. R. E. and Th. C. E. Fries (548 specimens); Tanganyika Territory, by the Department of Agriculture and the Conservator of Forests; West shore of Lake Tanganyika (coll. Mrs. M. D. Flynn), by Miss M. C. Knowles; various, by the Museum d'Histoire Naturelle, Paris.
- MASCARENE ISLANDS.—*Presented*: Madagascar, co-types of new species, by Mons. H. Perrier de la Bâthie.
- SOUTH AFRICA.—*Presented*: Mesembryanthemums, etc., by the Bolus Herbarium; *Myricaceae* and *Cyperaceae*, by Mrs. M. R. Levyns; succulents, by Mr. N. E. Brown; Griqualand West, by Miss M. Wilman; various plants, by the Division of Botany, Department of Agriculture, Pretoria, Dr. J. Burt Davy, Mr. Wellesley H. Robinson, the Rev. F. A. Rogers, Prof. Hans Schinz and the Commissioner of the South Africa Pavilion, British Empire Exhibition, Wembley.
- NORTH AMERICA.—*Presented*: North American Grasses, cent. 8, by the United States Department of Agriculture; various, by the Gray Herbarium, the United States National Museum, the California Academy of Sciences and Mr. I. H. Burkill.
Purchased: Mr. B. F. Bush, Missouri.
- CENTRAL AMERICA.—*Presented*: various, by the United States National Museum; *Fungi*, Prof. F. L. Stevens.
- WEST INDIES.—*Presented*: various, by the Trinidad Department of Agriculture; Trinidad ferns, by Archdeacon A. Hombersley.
Purchased: Mr. W. Broadway, Trinidad.
- EAST TROPICAL SOUTH AMERICA.—*Presented*: Brazil, Ceara, by Mr. G. C. Bolland; British Guiana (coll. R. A. Altson), by the Department of Science and Agriculture, and 350 specimens (coll. J. L. de la Cruz), by the New York Botanical Garden; *Fungi*, by Prof. F. L. Stevens.

WEST TROPICAL SOUTH AMERICA.—*Presented*: Colombia, 600 specimens (coll. F. W. Pennell, E. P. Killip and T. E. Hagen), by the Academy of Natural Sciences, Philadelphia (see Ann. Report Acad. Nat. Sci., Philadelphia, 1923, pp. 15-28); Galapagos Islands (coll. Alban Stewart), by the Californian Academy of Sciences, and (coll. "St. George" Expedition), by the Scientific Expeditionary Research Association.

Purchased: Mr. Cyril Allen, Colombia.

TEMPERATE SOUTH AMERICA.—*Presented*: Uruguay, by Dr. F. Felippone.

Purchased: Dr. E. Werdermann, Chili.

GENERAL.—*Purchased*: G. Polacci and A. Nannizzi, I Miceti Patogeni, fasc. 4.

The Bentham Trustees have presented Mrs. Lugard's drawings of Ngamiland plants (see *Kew Bull.*, 1925, p. 348), and 34 original drawings made by Miss Drake for Lindley's "Sertum Orchidacearum." Five hundred additional tracings of F. Stephani's drawings of *Hepaticae* have been purchased from Miss J. Stephani, many of them of species not previously represented at Kew and possibly of unique specimens.

The Library.

In the obituary notice of Dr. J. E. T. Aitchison, published in the *Kew Bulletin*, 1898, p. 310, it is stated that "for some time previous to his death he was engaged collecting materials for a *Flora Indiae Desertae* (i.e., North-west India, Afghanistan and Baluchistan), but his sufferings prevented him from working them out." These "materials" in the form of 8 packets of manuscript, each about 2 inches thick and of small quarto size, came last year into the possession of Dr. Aitchison's old friend, Major-General Sir R. Havelock Charles, G.C.V.O., and he, on the advice of Lieut.-Col. Sir David Prain, has presented them to the Royal Botanic Gardens, Kew. Though far from being in a fit state for publication they are likely to be of much use to other workers in the same field. It appears to have been Dr. Aitchison's purpose to prepare an extended edition of the work he published in the *Transactions of the Botanical Society of Edinburgh*, vol. xviii, pp. 1-226 (1891).

The Bentham Trustees have presented the following:— (1) An excellent copy of the Oxford edition (1723) of the writings of Aretaeus of Cappadocia in Greek and Latin. The Latin title reads:—*De causis et signis acutorum et diuturnorum morborum libri quatuor; de curatione morborum libri quatuor. Cum MSS. duobus, Harleyano et Vaticano, contulit, novamque versionem dedit Johannes Wigan.* (2) A copy in 5 octavo volumes of the work by F. A. P. de Garsault, *Description, vertus et usages de sept cents dix-neuf plantes . . . gravées sur les desseins d'après nature*, Paris, 1764-67, which contains some doubtful binomials for which priority has been claimed. A note concerning this work was published in the *Journal of Botany*, 1909, p. 322. (3) *Oriental memoirs*, by James Forbes,

second edition, 1834-35. (4) A collection of 245 water-colour drawings of Ngamiland plants, by Mrs. Lugard, to which reference is made in *K.B.* 1925, p. 348. (5) 34 original drawings for Lindley's *Sertum Orchidaceum* by Miss Drake and others.

The Carnegie Institution of Washington has presented 4 more volumes of its botanical publications, namely:—F. E. Clements and G. W. Goldsmith, *The phytometer method in ecology: the plant and community as instruments* (no. 356, 1924); F. E. Clements and J. E. Weaver, *Experimental vegetation: the relation of climaxes to climates* (no. 355, 1924); W. S. Cooper, *The broad-sclerophyll vegetation of California* (no. 319, 1922); and D. T. MacDougal, *Reversible variations in volume, pressure, and movements of sap in trees* (no. 365, 1925).

Prof. O. V. Darbishire has presented the two handsome volumes, *The Plums of New York*, 1911, and *The Cherries of New York*, 1915, by U. P. Hedrick and others, which formerly belonged to his cousin, the late Mr. A. D. Darbishire.

The manuscript list of the late Mr. J. S. Gamble's Herbarium, which he had presented to the Royal Botanic Gardens, Kew, was received from him shortly before his death. It consists of 11 volumes of various sizes. Mr. Gamble also presented a copy of *Man and nature; or physical geography as modified by human action*, by G. P. Marsh, 1864, and his working copies of several books, in some of which there are annotations and other manuscript matter, have been received from Mrs. Gamble. These include a complete set of Hooker's *Flora of British India*, Roxburgh's *Flora Indica* (Clarke's reprint), Brandis's *Indian trees*, Bourdillon's *Forest trees of Travancore*, Wight and Walker-Arnott's *Prodromus florae Peninsulae Indiae orientalis*, Mr. Gamble's *Manual of Indian timbers*, second and third editions, and his *Bambuseae of British India*.

A set of the *Travaux poursuivis au Laboratoire général des Productions coloniales, résués par F. Heim*, 1920-25, published by the Comité d'Encouragement aux Recherches scientifiques coloniales, Paris, have been received from Prof. F. Heim de Balsac, and the first 3 fascicles of a new periodical, *Riz et Riziculture*, published under his direction, have been presented by the Agence générale des Colonies, Paris.

A selection from the botanical correspondence of the late Dr. W. Botting Hemsley, consisting of 425 letters, has been received from his daughter, Mrs. E. H. Lovelock.

Dr. B. Daydon Jackson has presented the corrected proofs (in 4 volumes) and the corrected revises (in 6 volumes) of the *Index Kewensis*, the manuscript of which is preserved at Kew.

During the year 2 more parts (63 and 64) of Mr. J. H. Maiden's *Critical revision of the genus Eucalyptus* have been received from the author, the sad news of whose death has recently reached us. It was Mr. Maiden's purpose to complete his great work on *Eucalyptus* in about 70 parts, and then to prepare a key to all the species of the genus.

Dean E. D. Merrill has presented 2 more fascicles (vol. i, fasc. 3 and 4) of his *Enumeration of Philippine flowering plants*, and a typed copy of A. D. E. Elmer's *Field notes on Philippine plants*, nos. 7037 to 18477, forming 3 rather thick foolscap folio volumes. It is also due to the kind offices of Dean Merrill that the library has been supplied with a complete set (20 numbers) of the *Technical Papers* published by the California Agricultural Experiment Station, and the journal *Hilgardia*, vol. i, nos. 1 to 7, in which form the *Technical Papers* are being continued.

Lieut.-Col. Sir David Prain has presented the year's issues of the *Berichte der Deutschen Botanischen Gesellschaft*, and the *Proceedings of the American Philosophical Society*, the *Year-Book of Pharmacy . . . and Transactions of the British Pharmaceutical Conference*, 1924, and tome xv of the *Travaux du Laboratoire de Matière médicale de la Faculté de Pharmacie de Paris*.

The following have been contributed by Dr. Otto Stapf:—*Ferns of Tropical Florida*, 1918, by J. K. Small; *Guia botanica da Praça da Republica e do Jardim da Luz*, São Paulo, 1919, by A. Usteri; and several reprints of papers by H. Handel-Mazzetti, including the continuation of his *Plantae novae sinenses*, published in the *Anzeiger der Akademie der Wissenschaften in Wien*.

The Trustees of the British Museum have presented a copy of the third edition of the *Monograph of the Mycetozoa*, by Arthur Lister, revised by Miss G. Lister, and a *Guide to the fossil plants in the Department of Geology and Palaeontology*.

A bound copy of the new edition of the *Catalogue of the . . . Library of the Linnean Society of London* has been received from the Council.

The Secretary of State for India has presented parts 1 and 6 of *The botany of Bihar and Orissa*, by H. H. Haines, completing the work, and *The English factories in India*, 1665–1667, by Sir William Foster.

The Crown Agents for the Colonies have sent 3 copies of *The useful trees of Northern Nigeria*, by H. V. Lely; *Gold Coast plant diseases*, by R. H. Bunting and H. A. Dade; and *The handbook of British Guiana*, compiled by M. S. Metzgen and H. E. C. Cain.

Meteorological extracts from the Blue Books of the British Crown Colonies and Protectorates for the year 1923 have been received from the Director of the Meteorological Office, Air Ministry.

Two copies of a map of British Guiana, dated 1913, have been received from the Colonial Secretary, British Guiana.

The last volume (the fifth) of *The Flora of the Malay Peninsula*, by H. N. Ridley, has been published during the year. A complete set has been presented by the Government of the Straits Settlements and Federated Malay States.

From the Editor of *Nature*:—Ida Colthurst, *Familiar flowering trees in India*; St. John Marriott, *British woodlands as illustrated by Lessness Abbey Woods*; Sir W. Schlich, *Manual of forestry*, vol. iii, ed. 5 (received through Mr. C. E. C. Fischer); L. D. Stamp,

The vegetation of Burma from an ecological standpoint (received through Major T. F. Chipp); J. E. B. Warming, *Oecology of plants*, second impression; J. Weathers, *My garden book*; and R. O. Williams, *Gardening in the Tropics*.

Books received from their publishers, all of which have been briefly reviewed in the *Kew Bulletin*:—E. Artschwager and E. M. Smiley, *Dictionary of botanical equivalents*, ed. 2, from the London agents of Messrs. Williams and Wilkins Company; L. H. Bailey, *The principles of vegetable-gardening*, ed. 18, and E. P. Felt, *Manual of tree and shrub insects*, from Messrs. Macmillan; E. T. Cook, *Gardening for beginners*, ed. 8, and W. Irving, *Rock gardening*, from *Country Life*; Ida Lee (Mrs. C. Bruce Marriott), *Early explorers in Australia*, from Messrs. Methuen; R. Morse and R. Palmer, *British weeds*, from Messrs. Benn Brothers; A. S. Hitchcock, *Methods of descriptive systematic botany*, and R. T. and F. W. Rolfe, *The romance of the fungus world*, from Messrs. Chapman and Hall.

The following are the more important presentations of books, including some reprints from journals, received from their authors, unless otherwise stated:—Oakes Ames, *Schedulae Orchidianae*, no. 8, and *Enumeration of Philippine Apostasiaceae and Orchidaceae*; H. Andres, *Die Pirolaceen des rheinischen Schiefergebirges*, etc. (1909), and *Zusätze I and II*; E. B. Babcock and H. M. Hall, *Hemizonia congesta: a genetic, ecologic and taxonomic study of the hayfield tarweeds*; L. H. Bailey, *Gentes herbarum*, fasc. v; F. R. S. Balfour, *Account of the botany of Peeblesshire* (reprinted from *The History of Peeblesshire*); H. Basedow, *Narrative of an expedition of exploration in North-western Australia*, 1918; Mrs. F. Bolus, Miss D. Barclay and E. J. Steer, *A book of South African flowers* (from Mrs. Bolus who has also presented *Nature Notes*, nos. 13-22, and 48 coloured plates of South African flowers issued by the Wild Flower Protection Society of South Africa); *Catálogo de las plantas existentes en el Jardín de Aclimatación de La Orotava*, 1923 (from Mr. H. Spooner); R. H. Cheney, *Coffee: a monograph of the economic species of the genus Coffea L.* (from the Department of Biology, Washington Square College, New York University); H. H. Chung, *A catalogue of trees and shrubs of China*; W. G. Craib, *Florae siamensis enumeratio*, part 1 (from the Siam Society, Bangkok); P. R. Dupont, *Essai sur la structure et de la flore de quelques îles madréporiques de l'Océan indien*; A. Engler (Editor), *Beiträge zur Flora von Africa*, LI; G. Forrest, *Field notes on some plants . . . found . . . in 1924* (from Mr. J. C. Williams); H. A. Gleason, *Studies on the flora of Northern South America*, I-IV; A. A. Grossheim and B. Schischkin, *Schedae ad herbarium plantarum orientales exsiccatae*, fasc. I-VIII; T. Ito, *Icones plantarum Japonicarum*, vol. i, nos. 3-6; H. H. Janssonius, *Mikrographie des Holzes der auf Java vorkommenden Baumarten*, Lfg. 7 (also a copy received from the Botanic Garden, Utrecht); W. L. Jepson, *Manual of the flowering plants of California*, signatures 1 and 13 to 40, completing the work; H. Johansen, *Handbook of the principal*

trees and shrubs of the Ancon and Balboa Districts, Panama Canal Zone; F. Kraenzlin, *Monographie der Gattungen Masdevallia*, etc.; Y. Kudo, 8 reprints including his *Flora of the Island of Paramushir* (from Dr. A. W. Hill); H. J. Lam, *The Sapotaceae . . . of the Dutch East Indies*, etc.; R. Maire, *Études sur la végétation et la flore du Grand Atlas et du Moyen Atlas Marocains*; R. Majima, *Untersuchungen über den Japanlack*; S. C. Mason, *Date Culture in Sudan* (from Director, Department of Agriculture and Forests, Khartoum); Janet Perkins, *Übersicht über die Gattungen der Monimiaceae*, etc.; G. V. Perez, *A selection of botanical and other papers* (from Mrs. Perez); T. Petch, *Bibliography of books and papers relating to agriculture and botany [in Ceylon]* (from Director of Agriculture, Peradeniya); S. J. Record, *Bibliography of the woods of the world*, Supplement I; W. Robinson, *Wood fires for the country house and cottage*; J. L. Sager, *Studies in soil acidity*, 1923, and *The causes of rhythm in vital phenomena*, 1923; R. Schlechter *Orchidaceae novae et criticae*, Decades 1-77 (*Fedde, Repert.* ii-xx); D. F. van Slooten, *The Flacourtiaceae of the Dutch East Indies*; P. C. Standley and S. Calderón, *Lista preliminar de las plantas de El Salvador* (from the Smithsonian Institution); N. Stoyanov and B. Stefanov, *Flore de Bulgarie*, in Bulgarian (from the Bulgarian Ministry of Agriculture and Domains); H. Sydow, 79 mycological papers chiefly from the *Annales Mycologici*; D. Szymkiewicz, *Bibliografja flory Polskiej*; Allen Wedgwood, *Catalogue of the Wedgwood Herbarium*, 1920 (from Mrs. Wedgwood); E. H. Wilson, *America's greatest garden: the Arnold Arboretum* (from Prof. C. S. Sargent and C. M. Lewis); and Y. Yamamoto, *Supplementa Iconum plantarum Formosanarum*, I (from the Department of Forestry, Government Research Institute, Formosa).

Periodical and serial publications presented include:—*Acta Botanica Fennica*, Helsingfors, vol. i, no. 1, from Societas pro Fauna et Flora Fennica; *Acta Phytochimica*, Tokyo, vol. ii, nos. 2 and 3, from the Editor; Albany Museum, Grahamstown, *Records*, vol. iii, pt. 4, from the Committee of the Museum; *Anais do Instituto Superior de Agronomia*, Lisbon, vol. ii, from the Institute; *Annales Societatis Zoolog.-Botanicae Fennicae Vanamo*, Helsingfors, tom. i, from the Society; Arnold Arboretum, *Journal*, vol. vi, nos. 1 and 2, from Prof. C. S. Sargent; Australasian Association for the Advancement of Science, *Index to Reports*, vols. 1-xvi, from the Association; *Bothalia*, Pretoria, vol. i, pt. 4, from Dr. I. B. Pole Evans; British Association for the Advancement of Science, *Report*, 1924, from Miss E. M. Wakefield; *Bulletins* issued by Messrs Sutton and Sons, Reading, nos. 1-14, from Messrs. Sutton; East Malling Research Station, *Reports*, from Director; *Empire Cotton Growing Review*, London, vol. ii, nos. 1 and 2, from the Editor; *Japanese Journal of Botany*, Tokyo, vol. ii, nos. 2 and 3, from the National Research Council, Japan; Kyushu Imperial University, Fukuoka, Japan, *Journal of the Department of Agriculture*, vol. i, nos. 1, 3 and 5, from the Director; Linnean

Society of New South Wales, *Historical notes* . . . by A. B. Walkom, from the Society; London, Imperial Botanical Conference, 1924, *Report of Proceedings*, from the President and Executive Committee; Lyons, Société Linnéenne, *Annales*, 1924, and *Bulletin*, 1925, from Dr. A. W. Hill; *Memoirs of the National Academy of Sciences*, Washington, vol. xi, containing Prof. Trelease's work *The American Oaks*, from the Academy; *Orchid Review*, London, 1925, from the Editor; *Revista Argentina de Botanica*, La Plata, tomo i, nos. 2 and 3, from Prof. C. Spegazzini; *Science Reports of the Tohoku Imperial University*, Sendai, Japan, ser. 4, vol. i, no. 2, from the University; *Studies from the Tokugawa Institute*, Tokyo, vol. i, no. 1, from the Institute; *De Thee*, Buitenzorg, 5 numbers, from the Director, Theeproefstation; *Tropical Woods*, New Haven, U.S.A., nos. 1-4, from Prof. S. J. Record; Watson Botanical Exchange Club, *Annual Report*, 1924-25, from Mr. H. S. Thompson; and Yale University School of Forestry, *Bulletins*, nos. 9-13, from the School.

In addition to the societies, academies, and other institutions already mentioned the following have presented publications issued by them:—Royal Swedish Academy of Sciences, Stockholm; Royal University, Upsala; Danish Botanical Society and Botanical Garden, Copenhagen; Botanical Garden, Utrecht; Phytopathologisch Laboratorium "Willie Commelin Scholten," Baarn, Holland; Botanical Garden, Leningrad; Muséum National d'Histoire Naturelle, Paris; Botanical Museum, University of Zurich; Institute of Botany, University of Geneva; Faculty of Science, Masaryk University, Brno; Agricultural Research Institute Pusa; Indian Tea Association, Calcutta; Department of Agriculture, Peradeniya; Department of Agriculture, Buitenzorg; Bureaux of Science, Agriculture and Forestry, Philippine Islands; New Zealand Institute; Departments of Agriculture of Queensland, New South Wales, and Victoria; Agricultural and Commercial Society, Gold Coast; Department of Agriculture, Nigeria; Union of South Africa, Department of Agriculture; United States Department of Agriculture; Smithsonian Institution, Washington; Gray Herbarium of Harvard University; New York Botanical Garden; Brooklyn Botanical Garden; Cornell University Agricultural Experiment Station, Ithaca; Missouri Botanical Garden; Field Museum, Chicago; California Academy of Sciences; University of California; Direccion de Estudios Biologicos, Mexico; and the Museo Nacional de Historia Natural, Buenos Aires.